# Union Calendar No. 256

110TH CONGRESS
1ST SESSION

# H. R. 3776

**[Report No. 110–402]**

To provide for a research, development, and demonstration program by the Secretary of Energy to support the ability of the United States to remain globally competitive in energy storage systems for vehicles, stationary applications, and electricity transmission and distribution.

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IN THE HOUSE OF REPRESENTATIVES

OCTOBER 9, 2007

Mr. GORDON of Tennessee introduced the following bill; which was referred to the Committee on Science and Technology

OCTOBER 22, 2007

Reported with amendments, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in italic]

[For text of introduced bill, see copy of bill as introduced on October 9, 2007]

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# A BILL

To provide for a research, development, and demonstration program by the Secretary of Energy to support the ability of the United States to remain globally competitive in energy storage systems for vehicles, stationary applications, and electricity transmission and distribution.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

***SECTION 1. SHORT TITLE.***

*This Act may be cited as the "Energy Storage Technology Advancement Act of 2007".*

***SEC. 2. DEFINITIONS.***

*For purposes of this Act—*

*(1) the term "Department" means the Department of Energy;*

*(2) the term "electric drive vehicle" means—*

*(A) a vehicle that uses an electric motor for all or part of its motive power, including battery electric, hybrid electric, plug-in hybrid electric, fuel cell, and plug-in fuel cell vehicles, and rail transportation vehicles; or*

*(B) mobile equipment that uses an electric motor to replace an internal combustion engine for all or part of the work of the equipment;*

*(3) the term "islanding" means a distributed generator or energy storage device continuing to power a location in the absence of electric power from the primary source;*

*(4) the term "microgrid" means an integrated energy system consisting of interconnected loads and distributed energy resources, including generators and*

*energy storage devices, which as an integrated system can operate in parallel with the utility grid or in an intentional islanding mode;*

*(5) the term ''Secretary'' means the Secretary of Energy;*

*(6) the term ''self-healing grid'' means a grid that is capable of automatically anticipating and responding to power system disturbances, including the isolation of failed sections and components, while optimizing its own performance and service to customers; and*

*(7) the term ''spinning reserve services'' means an amount of electric generating capacity in excess of the amount needed to meet peak electric demand.*

***SEC. 3. BASIC RESEARCH PROGRAM.***

*(a) IN GENERAL.—The Secretary shall conduct a basic research program to support the development of energy storage systems for electric drive vehicles, stationary applications, and electricity transmission and distribution, including research on—*

*(1) materials design;*

*(2) materials synthesis and characterization;*

*(3) electrolytes;*

*(4) surface and interface dynamics;*

*(5) modeling and simulation; and*

*(6) thermal behavior and life degradation mechanisms.*

*(b) FUNDING.—For activities carried out under this section, in addition to funding activities at National Laboratories, the Secretary shall award funds to, and coordinate activities with, a range of stakeholders including the public, private, and academic sectors.*

*(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this section $50,000,000 for each of the fiscal years 2009 through 2014.*

***SEC. 4. APPLIED RESEARCH PROGRAM.***

*(a) IN GENERAL.—The Secretary shall conduct an applied research program on energy storage systems to support electric drive vehicle, stationary application, and electricity transmission and distribution technologies, including research on—*

*(1) ultracapacitors;*

*(2) flywheels;*

*(3) batteries and battery systems (including flow batteries);*

*(4) compressed air energy systems;*

*(5) power conditioning electronics;*

*(6) manufacturing technologies for energy storage systems;*

*(7) thermal management systems; and*

*(8) hydrogen as an energy storage medium.*

*(b) FUNDING.—For activities carried out under this section, in addition to funding activities at National Laboratories, the Secretary shall award funds to, and coordinate activities with, a range of stakeholders including the public, private, and academic sectors.*

*(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this section $80,000,000 for each of the fiscal years 2009 through 2014.*

***SEC. 5. ENERGY STORAGE SYSTEMS DEMONSTRATIONS.***

*(a) IN GENERAL.—The Secretary shall carry out a program of new demonstrations of advanced energy storage systems. These demonstrations shall be regionally diversified and shall expand on the Department's existing technology demonstration program. These demonstrations should include the participation of a range of stakeholders, such as rural electric cooperatives, investor owned utilities, municipally owned electric utilities, energy storage systems manufacturers, electric drive vehicle manufacturers, the renewable energy production industry, State or local energy offices, the fuel cell industry, and universities. Each of the demonstrations shall include one or more of the following objectives:*

*(1) Energy storage to improve the feasibility of "micro-grids" or "islanding", or the transmission and distribution capability to improve reliability in rural areas.*

*(2) Integration of an energy storage system with a self-healing grid.*

*(3) Use of energy storage to improve security to emergency response infrastructure.*

*(4) Integration with a renewable energy production source, either at the source or away from the source.*

*(5) Use of energy storage to provide ancillary services, such as spinning reserve services, for grid management.*

*(6) Advancement of power conversion systems to make them smarter, more efficient, able to communicate with other inverters, and able to control voltage.*

*(7) Use of energy storage to optimize transmission and distribution operation and power quality, which could address overloaded lines and maintenance of transformers and substations.*

*(8) Use of advanced energy storage for peak load management of homes, businesses, and the grid.*

*(9) Use of energy storage devices to fill up nonpeak generation periods for electricity demand to make better use of existing grid assets.*

*(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this section $30,000,000 for each of the fiscal years 2009 through 2014.*

***SEC. 6. VEHICLE ENERGY STORAGE DEMONSTRATION.***

*(a) IN GENERAL.—The Secretary shall carry out a program of electric drive vehicle energy storage technology demonstrations. These technology demonstrations shall be conducted through consortia, which may include energy storage systems manufacturers and their suppliers, electric drive vehicle manufacturers, rural electric cooperatives, investor owned utilities, municipal and rural electric utilities, State and local governments, metropolitan transportation authorities, and universities. The program shall demonstrate one or more of the following:*

*(1) Novel, high capacity, high efficiency energy storage, charging, and control systems, along with the collection of data on performance characteristics such as battery life, energy storage capacity, and power delivery capacity.*

*(2) Advanced onboard energy management systems, and highly efficient battery cooling systems.*

*(3) Integration of such systems on a prototype vehicular platform, including with drivetrain systems for passenger, commercial, and nonroad electric drive vehicles.*

*(4) New technologies and processes that reduce manufacturing costs.*

*(5) Integration of advanced vehicle technologies with electricity distribution system and smart metering technology.*

*(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this section $30,000,000 for each of the fiscal years 2009 through 2014.*

***SEC. 7. SECONDARY APPLICATIONS AND DISPOSAL OF ELECTRIC DRIVE VEHICLE BATTERIES.***

*(a) IN GENERAL.—The Secretary shall carry out a program of research, development, and demonstration of secondary applications of energy storage devices following service in electric drive vehicles, and of technologies and processes for final recycling and disposal of these devices.*

*(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for carrying out this section $5,000,000 for each of the fiscal years 2009 through 2014.*

***SEC. 8. COORDINATION AND NONDUPLICATION.***

*To the maximum extent practicable, the Secretary shall coordinate activities under this Act with other programs and laboratories of the Department and other Federal research programs.*

***SEC. 9. COST SHARING.***

*The Secretary shall carry out the programs under sections 6 and 7 in compliance with section 988 (a) through (d) and section 989 of the Energy Policy Act of 2005 (42 U.S.C. 16352(a) through (d) and 16353).*

Amend the title so as to read: ''A bill to provide for research, development, and demonstration programs in advanced energy storage systems for electric drive vehicles, stationary applications, and electricity transmission and distribution applications, to support the ability of the United States to remain globally competitive in this field, and to promote the efficient delivery and use of energy.''.

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